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Acceptability of the Patrol Ration
One Man

T.N. Stephenson, P.J. Cavanough and
G.E. Driver

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**Combatant Protection and Nutrition Branch
Aeronautical and Maritime Research Laboratory**

DSTO-TN-0136

ABSTRACT

This report illustrates the current level of user acceptability and service suitability of the PRIM, and each of its components, currently in service in the ADF. Items which have diminished in their acceptability have been identified and recommendations for appropriate alterations have been made.

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Acceptability of the Patrol Ration One Man

Executive Summary

The Patrol Ration One Man (PR1M) is the light weight ration used by special forces soldiers of the Australian Defence Force (ADF). It is the combat ration pack (CRP) produced in smallest numbers but has an important role for the long range patrol activities of the ADF.

The PR1M was last field tested in 1991. In the meantime the ration has been modified, and the food preferences of the soldier are expected to have changed. A questionnaire survey was conducted with soldiers of the Special Air Service Regiment (SASR) and the 3rd Royal Australian Regiment (3RAR). The questionnaire covered aspects of acceptability of both individual items and the ration "as a whole", the service suitability of PR1M and identified items which are not currently being consumed. Assessment of the service suitability involved applicability of both the food and non-food items as well as the packaging to field activities.

The major conclusion drawn from this study was the need to make changes to the current PR1M to reduce the amount of culling and replacement of items evident from the responses received. Several improvements to items in PR1M have been identified.

Investigation into the possibility of introducing an extra-light-weight ration, which is not as reliant on sourcing of water, does not contain the same quantity of food or bulk, but is high in carbohydrate, should be conducted to better meet the needs of the end users.

Recommendations have been made in terms of further research and improvements needed to increase the acceptability of the current PR1M. The major recommendations were the need to investigate:

- the possibility of introducing an extra-light weight ration, and
- the effect of culling, exchange and addition of other items on the overall energy consumption and the impact on body reserves if there is a deficit in energy intake.

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1. Introduction

The Defence Nutrition Research Centre (DNRC) evaluates the suitability and acceptability of combat ration packs in service with the ADF. Information received from the Special Air Service Regiment (SASR) (Thomson, 1996) on discards from Patrol Ration One Man (PR1M) and Combat Ration One Man (CR1M), led to a study to determine the field acceptability and service suitability of the current PR1M when used in the field. The field acceptability and service suitability of the PR1M was last reported in 1991 (Morrissey and Waters, 1991).

The PR1M is not widely used by the Australian Army. Currently, the major users are the SASR, 1 Commando Regiment and 3 Battalion Royal Australian Regiment (3RAR). The pack is designed for issue to individuals as the tactical situation dictates or when no form of group feeding is practicable. The ration is nutritionally complete, and requires no foodstuffs supplementation. Water, additional to normal requirements, is required to re-hydrate the freeze-dried and dehydrated components (DOD, 1996).

Each ration pack provides food for one person for one day with an average energy value of 14,000 kJ. The pack is nutritionally balanced providing sufficient energy to meet bodily requirements as well as essential nutrients comprising fats, sugars, vitamins and minerals (DOD, 1996).

The PR1M is designed around two sachets of freeze-dried meals, plus other lightweight ration components. There are five menus to maintain variety, with items such as biscuits, chocolate, tea, coffee, sugar and milk being common to each menu.

This report describes the current level of user acceptability and service suitability of the PR1M. Also identified are items which have diminished in their acceptability and recommendations for appropriate alterations have been made.

2. Methods

A questionnaire, based on previous work at DNRC (Forbes-Ewan and Waters, 1988), was used to evaluate the current level of user acceptability and service suitability of PR1M. It was designed to gather as much information as possible, including:

- whether soldiers like existing items and comments on the quantities provided,
- what additions/replacements would soldiers prefer,
- how often do soldiers consume items in existing rations,
- which items are culled by soldiers from PR1M, and
- additional items which are taken on exercises.

A copy of this questionnaire is at Appendix A.

Questionnaires were distributed to both SASR, including 152 Signals Squadron (152 SIG SQN) who largely performed the same activities, and 3 Battalion Royal Australian Regiment (3RAR).

SASR received 300 questionnaires and 3RAR 100, with 87 (29%) and 39 (39%), respectively, being completed and returned. The majority of surveys were completed while soldiers were on field exercises, including counter terrorist exercises. Surveys were completed during the month of November, 1996.

The results from the two surveyed groups have been combined for analysis. Instances of large variation between the two study groups have been highlighted in this report. Statistical analysis of data was performed within Microsoft Excel spreadsheets.

3. Results and Discussion

Appendix B contains results from both groups who took part in the survey. It also contains calculated weighted means for all responses.

3.1 Characteristics of sample groups

Table 1 shows the number of respondents, average years of service and range in years of service for each group surveyed.

Table 1: Summary of the characteristics of service personnel surveyed

GROUP	Number of respondents	Average years of service	Range in years of service
SASR incl. 152 SIG SQN	87	8.7	1.3-18
3 RAR	39	3.5	0.5-24
Total	126	7.1	0.5-24

The length of time spent on PR1M per exercise was found to vary between 3RAR and SASR. 3RAR were using PR1M for up to one week whereas SASR commonly used PR1M for one to two weeks. The maximum time spent on PR1M was twice as long for SASR as compared to 3RAR. Table 2 illustrates that SASR utilised PR1M rations most commonly for 20-40 days per year whereas 3RAR most commonly only utilised PR1M rations for up to 10 days per year.

Table 2: Annual usage of PR1M by SASR and 3RAR

GROUP	Percentage of respondents consuming PR1M per year				
	0-10 days	10-20 days	20-40 days	40-60 days	over 60 days
SASR incl. 152 Sig SQN	11	19	34	17	19
3 RAR	59	9	9	12	12
Average	33	14	24	14	15

3.2 Biscuits/Cereals

Figures 1 and 2 show the frequency distribution for opinions on the taste and quantity of biscuits and cereals. The taste of sweet biscuits, beef and chicken noodles and muesli bars was considered to be good to very good by the majority of respondents. Opinions on taste of rice, potato and onion powder and survival biscuits were somewhat varied, all having averages of fair/poor.

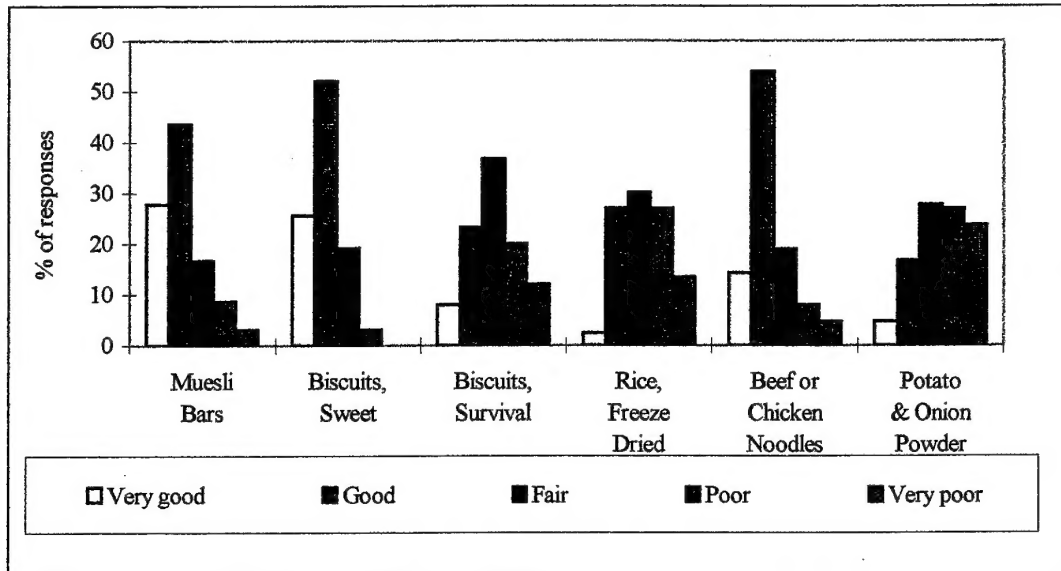


Figure 1: Taste rating on biscuits/cereals in PR1M

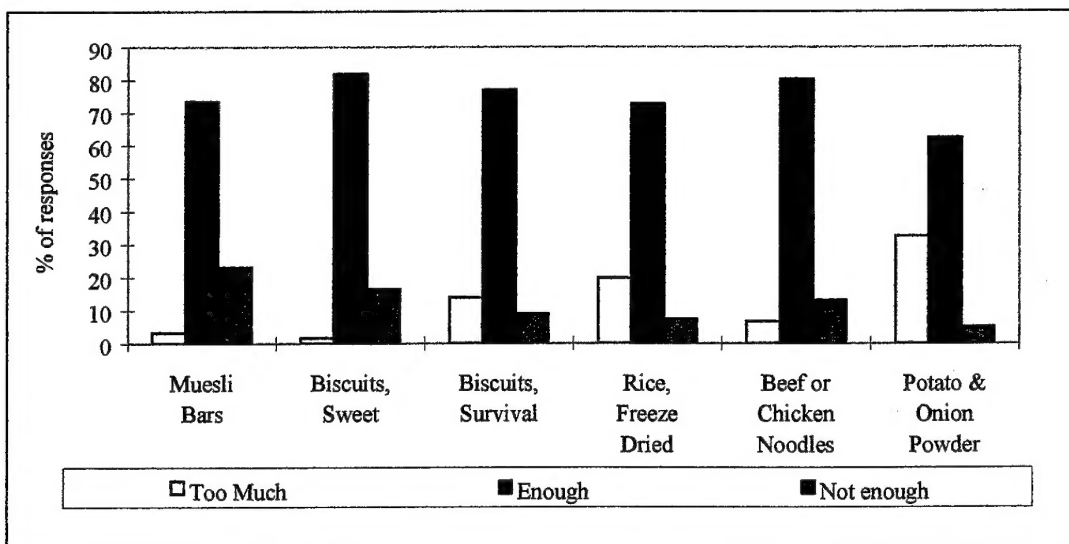


Figure 2: Quantity rating on biscuits/cereals in PR1M

The predominant comments were:

- rice was tasteless, hard, required too much water and took too long to prepare;
- potato and onion powder was tasteless (*"tastes like cardboard"*), salty and could not be eaten cold;
- noodles were awkward to handle and took too long to prepare; and
- survival biscuits were tasteless.

In most instances the quantity of these items was sufficient, however more than 30% of the respondents considered there was too much potato and onion powder. This may be related to its perceived poor taste.

Table 3 illustrates the acceptability by respondents to changes proposed to the cereal component. Inclusion of a savoury biscuit (cracker biscuit) was strongly supported (64%).

Table 3: Percentage of respondents in favour of proposed changes to cereal component of PR1M

Proposed change	% in favour
Include raisin luncheon biscuits	46
Make use of savoury biscuits	64
Use of whole grain rice	23
Delete noodles	19
Delete rice	35
Delete potato / onion powder	53
Greater variety	52

Many would like to see potato and onion powder, and rice removed from PR1M and replaced with items such as a savoury biscuit. Replacement of the survival biscuit with a savoury biscuit (Vita-weat crispbread) has already been implemented by the ADF. The introduction of 'two minute noodles' to replace the existing noodles is worthy of further investigation as many current users exchange ration noodles for the commercially available version since these re-hydrate more quickly.

3.3 Confectionery

Both chocolate and M&M candies were frequently consumed whereas chewing gum was only 'sometimes' consumed. A majority of respondents (59%) would like to see changes made to the existing confectionery. Of the changes suggested, 77% would like the inclusion of dried fruits and 66% would like the inclusion of soft lollies (jubes). The

predominant suggestions regarding confectionery supported the introduction of a fruit and nut mix and the inclusion of chocolate or candy bars such as Mars Bars.

3.4 Main meals

Figure 3 illustrates the acceptability of the taste of freeze dried meals. All meals were found to rate an average of at least 'fair'. Chicken tetrazzini was rated the most acceptable, followed by spaghetti and meat sauce and, roast pork and gravy. Predominant comments were that many of the meals, including tuna and rice, lamb curry and rice, roast pork and gravy, and beef steak fingers, were bland and some meals (including tuna and rice, beef and beans and beef steak fingers) were salty.

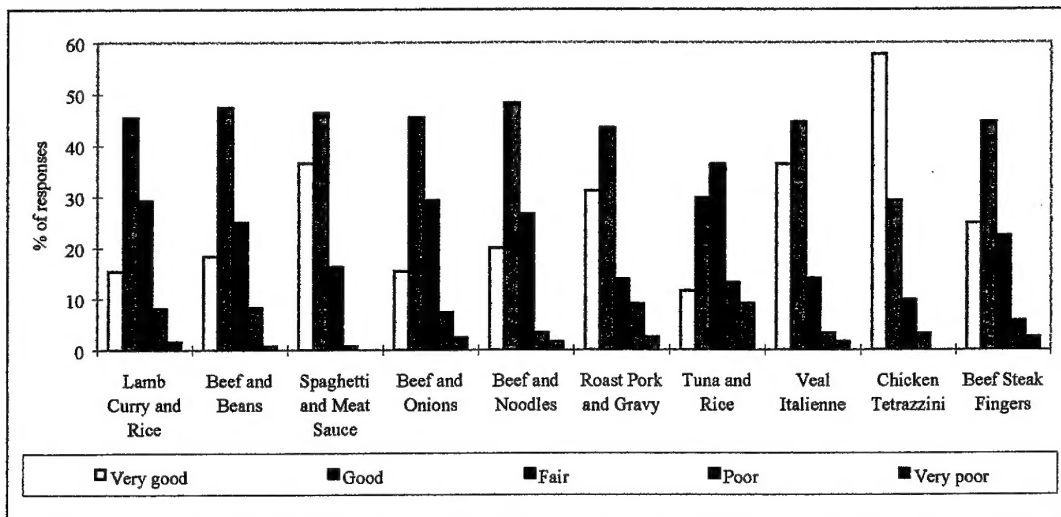


Figure 3: Taste rating on freeze dried meals in PR1M

Main meals which were considered to be bland need to be reformulated to increase flavour. This may be overcome by the inclusion of extra flavouring sachets. Many respondents requested inclusion of garlic, chilli and tomato sauce/paste (Section 3.6).

Of the changes suggested, 69% of respondents would like inclusion of a meal that may be eaten cold. Half of the respondents would prefer a spicy meal and another chicken meal. Less than 10% would like to see the inclusion of another fish meal. The addition of a meal not requiring heat, such as a breakfast type meal, and the inclusion of a spicy meal would serve to expand the diversity of main meals and possibly increase the acceptability of main meals.

There have been significant changes made to the freeze-dried meals during the past two years at the Defence Specialised Food Facility (DSFF). Since production in 1995, DSFF have been working to increase the flavours and reduce saltiness of all freeze-

dried meals. In 1997 four new meals, lamb casserole, beef teriyaki, tuna mornay and beef and black bean, were added to the menus of PR1M.

Many respondents also commented that there were insufficient amounts in these meals (especially the 75 g pouches) and that vegetables were missing from many of the menus. The PR1M was designed to have one large meal containing meat, vegetables and cereal component (rice or potato) and a smaller meal containing mostly meat with flavourings (sauces). This smaller meal was intended to be consumed with the rice, noodles or potato powder supplied in PR1M. Soldiers need to be educated in the operational concepts of PR1M. If this were achieved then clearly views on the 75 g pouches would change. Alternatively, the smaller meals could be redesigned to include the cereal components (currently supplied separately). In doing this, the low acceptability ratings for these cereal components (section 3.2) may be alleviated.

The majority (85%) of respondents prepared freeze dried meals by heating water and adding it to the meal. In addressing the problems with meals, 35% of respondents indicated that field duties do not allow enough time to heat meals and one quarter indicated that they had problems opening pouches. A large number also made the comment that the inner paper bags were noisy and for this reason were not appropriate for field activities. The majority (79%) of respondents consumed freeze dried meals quickly.

3.5 Beverages

The majority of respondents indicated that the taste of beverages they consumed was at least 'fair' (Figure 4). It should be noted that 29% did not drink tea and almost 20% did not consume coffee. One notable variation between the two study groups was the number not consuming tea—44% of 3RAR as opposed to 23% of SASR. 3RAR were also more accepting of the chocolate drink powder. This was emphasised by the question on suggested changes to beverages—67% of 3RAR would like more chocolate drink powder as opposed to only 28% of SASR.

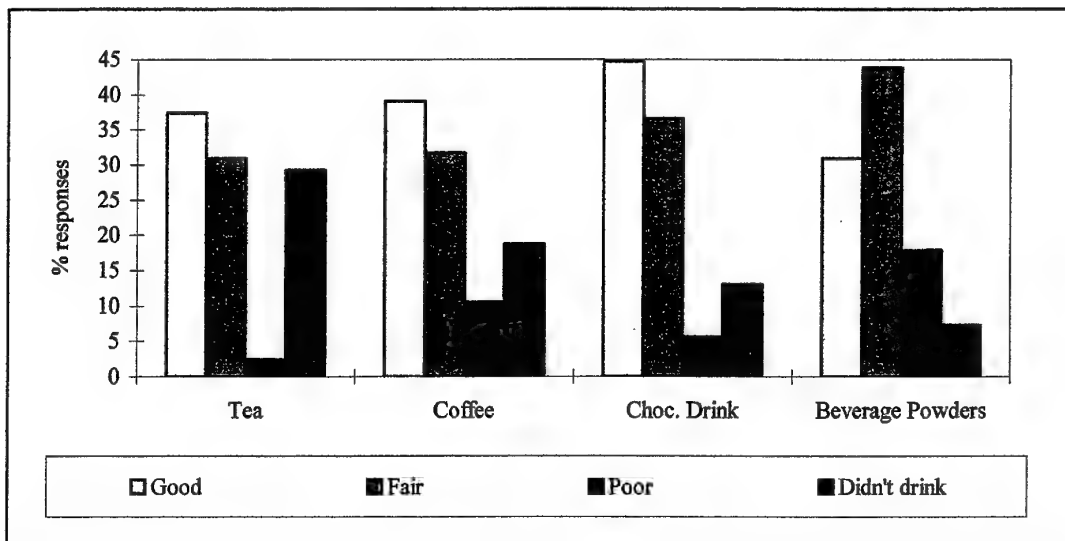


Figure 4: Taste rating of beverages in PR1M

Less than 5% of all respondents expressed a desire for more tea and less coffee. On the other hand, 36% were in favour of more coffee and less tea in PR1M. The majority of all respondents (64%) wanted an improved fruit drink in PR1M and the addition of a soup was favoured by 49%.

The existing 'brew kit' was found to contain sufficient tea/coffee/chocolate drink. It was considered that there was too much sugar, as 40% indicated they discard some sugar while culling PR1M. Sugar is however, an excellent source of readily available energy. Other methods for increasing carbohydrate and sugar intake need to be considered. Thomson, Walker and Forbes-Ewan (1997), in their review of methods to improve fluid intake, recommended the inclusion of 'sports drinks' in ration packs. These drinks are highly acceptable (unpublished data) and supply a readily useable source of carbohydrate. If a sports drink was to be included this would replace some of the sugar not currently consumed.

As an overwhelming majority (96%) of respondents were satisfied with condensed milk (as their milk source) there is no need to change the form of milk in the PR1M. The two study groups were found to have different opinions on the quantity of condensed milk required; 82% of SASR indicated there was enough while only 32% of 3RAR were of the same opinion. This difference may be associated with SASR's limited access to water and the varied preference for beverage between the two study groups.

3.6 Condiments

The majority (82%) of respondents believed there was enough salt, whereas 15% believed there was too much. The majority of 3RAR considered there was enough sugar whereas SASR leant toward the view that there was too much sugar. Sugar has been reduced from 12 to 10 sachets in the 1997/98 procurement of PR1M. Of all respondents, 78% believed that there was enough pepper, whereas 17% indicated that there was too much. The suggestion that 'other flavourings' be added to packs was favoured by 76%. The most commonly suggested flavourings were chilli, garlic and tomato.

Diversifying the range of condiments currently present in PR1M may serve to increase the acceptability of the main meals.

3.7 Non-food items

There was considerable variation between the two study groups regarding both the ease of obtaining water and the sources from which it was obtained (Table 4). SASR were more likely to obtain water from natural sources than 3RAR. The preferred natural source was running water, but they also acquired water from ponds and lakes. The SASR used these less preferred sources 14 times more frequently than 3RAR. From this response it was obvious that obtaining water was harder for SASR than for 3RAR. This finding was exacerbated by the fact that SASR utilise PR1M for longer periods of time.

Several respondents also indicated that they collected rain water.

Table 4: Acquisition of water

Group	Ease of obtaining water			Source of water*		
	Hard	Fair	Easy	Stream/river	Lake/pond	Army supplied
SASR	33%	56%	11%	72%	44%	87%
3RAR	5%	61%	34%	21%	3%	100%

* percentages do not add up to 100% as respondents were allowed to select more than one option

Evaluation of the hexamine stove revealed that the majority (69%) rated the speed of heating as fair. Only 3% indicated that the stove was hard to use, while 47% considered the stove to be acceptable and 41% being of neutral opinion. Only 7% indicated that they never used the stove and 45% always made use of the stove.

Boxes of matches were considered to be unsatisfactory by a majority of both SASR (70%) and 3RAR (82%). Suggestions for improvements included the need for waterproofing (possibly by packing matches in a plastic container); making matches more sturdy (to avoid breaking while striking) and improving the striking process by

improving the flint. Many commented that they discarded the box of matches and used a lighter in its place.

A majority (83%) considered there to be sufficient toilet paper and it was assessed as satisfactory for use by 87% of respondents.

3.8 Exchanged items

In all, 36% of respondents exchanged one or more PR1M items. Once again this was more predominant with SASR (42%) than 3RAR (24%). There was no discernible pattern in this, it varied from trading one main meal for another (*Anything for chicken tetrazzini being the main comment regarding meal swaps*), tea for coffee (or vice versa), 'sweets' for muesli bars, or "anything for biscuits".

3.9 Discards and additional items taken into the field

Culling of items/materials from PR1M is a common practice, many soldiers replacing discarded items with commercially purchased items. A majority (68%) of respondents indicated that they discarded at least one food item. This process was found to be more predominant with SASR (78%) than with 3RAR (49%). Most common items being culled from PR1M were sugar (some of), salt, coffee/tea (some of), potato and onion powder, rice, beverage powders and 'sweets', many of which are high energy foods. The most common reasons being that there was either excess of these items or that they were not liked.

A total of 83 respondents (66%) listed additional items taken on exercises. The most popular were varieties of spicy sauce (tabasco, chilli etc) and noodles (or other pasta). Tabasco sauce is now included in PR1M.

Other items used as replacements and adjuncts included nuts and dried fruit, salami and other long life meats, chocolate blocks and chocolate bars, pitta bread, sweets or lollies, sports drinks, multivitamins, garlic and muesli bars. Nuts, commercial chocolate blocks/bars, pitta bread and garlic are not presently suitable for inclusion in PR1M as they do not have the capacity to survive the storage conditions applied to PR1M prior to issue.

Non-food items rejected included matches, instruction sheets, plastic spoons and double packaging. Boxes of matches were considered to be unsatisfactory, many discarding them and carrying a lighter instead. Improving the packaging and flint of match boxes may increase the acceptability.

Disposal of instruction sheets before exercises is not envisaged as a problem, as long as soldiers are familiar with the guidelines provided. Plastic spoons were disposed of as they were considered to be 'too easily broken'. Introduction of a more durable spoon may increase the likelihood of it being used in the field.

3.10 Potential new products

When given the opportunity to nominate new items for PR1M, many simply asked for more variety and higher overall energy, more specifically high carbohydrate food and a breakfast type meal. Requests for specific items included dried fruit (or fruit and nut mix), dehydrated desserts, Mars Bars, dried meats and spicy sauces. Items most commonly nominated for deletion included potato and onion powder, rice products, chewing gum, some of the brew gear and some sugar.

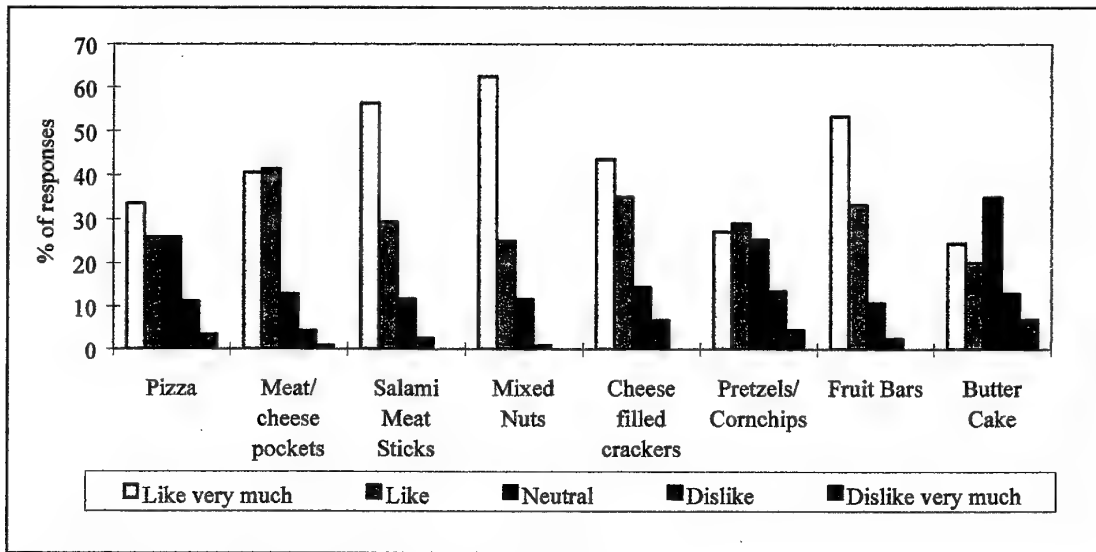


Figure 5: Rating on potential new items for PR1M

Figure 5 illustrates the distribution of acceptability of potential new ration items suggested in the questionnaire. Fruit bars, mixed nuts, salami meat sticks and cheese products are favoured over Pizza, pretzels/corn chips and butter cake.

3.11 Overall ration design

Currently, 82% of the SASR respondents consider there to be enough food in PR1M with 17% stating 'not enough'. 3RAR on the other hand are divided - 49% indicating enough and 51% would prefer more. While it might be considered that SASR require a greater amount of food (due to increased energy expenditure), the majority of SASR considered there to be sufficient food in PR1M. This may be because SASR are required to carry their food, and may have less access to transport.

The packaging was considered suitable by 95% of 3RAR subjects and only 59% of SASR. A frequent suggestion made by SASR was to eliminate the doubling up of packaging. Many considered the white inner bag of freeze dried meals to be both unnecessary and noisy. Many commented that they do not make use of these inner

white bags for measuring water and could not see the reason for having them in PR1M. Double wrapping of items including muesli bars was also considered unnecessary. Soldiers are currently discarding excess wrapping before embarking on field exercises, to reduce waste.

The double packaging is sometimes added to enable manufacturers to guarantee the ADF's required shelf life. Removal of additional packaging before field exercises is therefore acceptable. Soldiers need to be made aware of the reasons for double wrapping (to improve shelf life of products and to apply camouflage to packaging) and that there is no problem with the practice of discarding the double wrapping before field exercises.

An overwhelming majority (98%) of all surveyed believed that the instructions were clear and informative. The majority also consider the weight of PR1M to be satisfactory and where it was considered too high for tactical situations, this has been rectified by the culling of ration items prior to use. The rating on the size of PR1M, however, indicates a concern of many respondents. The size was considered unacceptable ("too bulky") by 25% with a further 50% rating the size as only 'fair'. Reduction in the size of PR1M while maintaining/improving carbohydrate levels is therefore a goal.

When questioned on the suitability of PR1M for patrol activities, 49% of respondents indicated that there were situations where PR1M was not suitable. These included those where water supply was limited and where PR1M was used for long durations. Moreover, 79% of SASR and 58% of 3RAR respondents were in agreement that a very light weight ration (which would not provide as much food) would be suitable. This ration was considered suitable on an occasional basis by 64% of respondents and only 8% suggested that it would be rarely used. The predominant reasons for its introduction would be:

- to conserve body water when water is hard to obtain (through the higher carbohydrate to protein ratio), and
- to reduce weight and bulk where these become important tactical considerations.

It was obvious from the results that the two study groups have different requirements of PR1M. SASR require a ration which is somewhat lighter and with less bulk than 3RAR's requirement. In addition, SASR were more restricted than 3RAR in their access to water (commonly sourcing water from natural sources) and their patrols were for longer periods. As SASR were more frequent users of PR1M, these differences in requirements became very significant in terms of suitability to the end user. PR1M was designed for use where water is readily available and as a result SASR were more restricted by this criterion.

More suitable to the needs of SASR would be the introduction of an extra-light-weight ration which, is not as reliant on sourcing of water, does not contain the same quantity of food or bulk, but is high in carbohydrate. Any reduction made to the reliance on

water for re-hydrating ration components should not compromise the daily fluid intake necessary for soldiers undertaking field exercises. Increasing the carbohydrate component would also need to be addressed in terms of the recommended fat/protein/carbohydrate ratios for the ADF (Forbes-Ewan, 1993).

A study of any proposed extra-light weight ration should include reassessment of the need for retention of both CR1M and PR1M. If an extra-light-weight ration is to be introduced and the features which make it unique are those which the PR1M currently holds over the CR1M, then there may be no need for retaining the PR1M. This can also be viewed from another perspective in that many factors which are currently not favourable about the use of PR1M, are rectified within CR1M. To take an example, the PR1M is lighter than CR1M. However, soldiers dislike the fact that this brings about the requirement for a larger external requirement of water. The introduction of an ultra-light-weight ration, possibly structured around higher carbohydrate bars (hence less protein and a reduction in the requirement for water) would provide the lighter ration required while decreasing the demand for water.

Having given those surveyed the opportunity to provide any further suggestions for improving PR1M, the predominant responses were requests for:

- modifications to packaging to reduce quantity and noise,
- introduction of a more compact, higher carbohydrate, smaller quantity ration,
- more variety in meals, and
- inclusion of a high energy bar.

4. Conclusions

Culling of items/materials from PR1M is a common practice, many soldiers replacing discarded items with commercially purchased items. The effect of culling, exchange and addition of other items on the overall energy available to the soldier needs to be assessed to determine the impact on body reserves if there is a deficit in energy intake.

Changes need to be made to the current PR1M to reduce the amount of culling and replacement of items evident from the responses received. Changes made should take into account the current likes and dislikes of the end users as well as the nutritional requirements specified for the ADF (Forbes-Ewan, 1993).

Several improvements to items in PR1M have been requested. These include improvement to the flint and waterproof ability of current match boxes, increase in reconstitution rate of noodles, introduction of an improved beverage and chocolate drink powder and revision of the confectionery range.

The packaging concerns raised by soldiers need to be addressed. Soldiers need to be made aware of the purposes for double wrapping and educated to discard excess packaging before embarking on field exercises. The high noise levels created by inner

white bags of freeze dried meals need to be reduced to an operationally acceptable level.

Investigation into the possibility of introducing an extra-light-weight ration, which is not as reliant on sourcing of water, does not contain the same quantity of food or bulk, but is high in carbohydrate, should be conducted to better meet the needs of the end users.

5. Recommendations

It is recommended that:

- DNRC be tasked to investigate:
 - ◊ the possibility of introducing an extra-light weight ration. If this ration is a viable option, further work will need to be done on the design of this ration. This should include reducing the reliance on obtaining water, increasing the carbohydrate content and assessing the future requirement of the existing PR1M, and
 - ◊ the effect of culling, exchange and addition of other items on the overall energy and the impact on body reserves if there is a deficit in energy intake.
- Biscuits/cereals be improved by:
 - ◊ removing or reducing potato and onion powder and freeze dried rice, as these items are not being consumed by many of the end users, and
 - ◊ Improving the reconstitution ability of the current noodles.
- Confectionery be improved by:
 - ◊ introducing dried fruit and soft lollies (jubes), and
 - ◊ removing chewing gum.
- Main meals be improved by:
 - ◊ addition of a breakfast type meal, one which does not require heating or water.
- Beverages be improved by:
 - ◊ replacing the current fruit drink with a 'sports drink' powder, and
 - ◊ improving the current chocolate drink powder.
- Condiments be improved by:
 - ◊ inclusion of new flavours, including chilli, garlic and tomato sauce.

- Non-food items be improved by:
 - ◊ removing or replacing the present double packaging in PR1M with more operational and environmentally friendly packaging. Where double packaging is necessary, service personnel need to be informed of its importance,
 - ◊ improving the level of waterproofing of the match and the container, and
 - ◊ improving the flint of matches.

6. Acknowledgments

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7. References

Department of Defence (DOD) (1996). *Australian Defence Force Food Specifications (ADFFS)*, ADFFS 20-1-2, October 1996, Commonwealth of Australia.

Forbes-Ewan, C. (1993). *ADF Nutrient Requirements. A report on the nutrient requirements of ADF members engaged in base, operational and training activities*, DSTO (MRL) Tasmania.

Forbes-Ewan, C.H. and Waters, D.R. (1988). Redesign of Australian Operational Ration Packs as a result of field acceptability studies. *Proceedings C.D.S.O. Food Study Group Symposium*, Malaysia, 25-29 January, 1988.

Morrissey, B.L.L. and Waters, D.R. (1991). Field Evaluation of the Australian Patrol Ration. *Proceedings C.D.S.O. Food Study Group*, 9th C.D.S.O. Conference, New Zealand, 18-22 February, 1991.

Thomson, G. (1996). *Discards from PR1M and CR1M: Information received from SASR during CHO trial Perth, May 1996*, 4 June 1996, DNRC File 8970/2/4 folio 30.

Thomson, G.F., Walker, G.J. and Forbes-Ewan, C. (1997). *Review of methods of improving the intake and absorption of water into the body by the use of alternative supply methods and/or additives*, Technical Report DSTO-TR-0483, Defence Food Science Centre, Ship Structures and Materials Division, Aeronautical and Maritime Research Laboratory, May 1997.

Appendix A:

Questionnaire for Patrol Ration One Man (PR1M)

To improve the acceptability of the Patrol Ration one man we need to find out what you think about it. As a frequent user of Ration packs, you are in the best position to advise us on any changes needed to improve this pack, so please don't hesitate to give your real opinion of each item. Your answers will assist us in improving the ration pack for you. You may answer questions on items not tried on this exercise if you are familiar with them from previous exercises.

Your answers will be confidential - we do not need name, rank or number, only the following:

DATE: ____/____/19____ UNIT: _____
YEARS IN ADF: _____

EXPLANATION OF QUESTIONS

This questionnaire uses four styles of question, described below.

A. The "rating scale" contains a series of descriptive words. You answer by drawing a circle around the word you agree with; for example:

At home, how often do you have chocolate drinks?

NEVER RARELY SOMETIMES OFTEN EVERY DAY

This would imply that you often have chocolate drinks, but not every day.

B. The simple YES / NO question, where you circle the answer you agree with.

C. The checklist gives a series of possible answers. Tick the box for each answer you agree with. For example:

Which of the following chocolate drinks do you prefer?

MILO ☒

OVALTINE ☐

CADBURY'S DRINKING CHOCOLATE ☒

OTHER (please describe): _____

This would imply that you like Cadbury's drinking chocolate and Milo.

D. The final type of question asks you to give a simple written answer. This is identified by a line, which follows the question.

BISCUITS / CEREALS

1. Indicate your opinion of the following items by circling the appropriate answer.

BISCUITS, SWEET (SHORTBREAD, JAM SANDWICH, GINGERNUT):

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

BISCUITS, SURVIVAL:

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

RICE, FREEZE DRIED:

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

POTATO AND ONION POWDER:

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

BEEF OR CHICKEN NOODLES:

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

MUESLI BARS:

Taste: VERY GOOD GOOD FAIR POOR VERY POOR
Quantity: TOO MUCH ENOUGH NOT ENOUGH

For those items you consider "POOR" or "VERY POOR", please say why, eg. 'Survival Biscuits too hard', 'Rice tasteless', 'Noodles too salty', or 'Shortbread broken up':

2. Which if any of the following changes to the biscuits and cereals would you like to see? (tick all you agree with)

INCLUDE RAISIN LUNCHEON BISCUITS	[]
MAKE USE OF SAVOURY BISCUITS (eg. cheese crackers)	[]
USE OF WHOLE GRAIN RICE	[]
DELETE NOODLES	[]
DELETE RICE	[]
DELETE POTATO / ONION POWDER	[]
GREATER VARIETY	[]
OTHER: (please describe)	

CONFECTIONERY

3. Show how often you ate the following items in the field:

Chocolate:	NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS
Chewing gum:	NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS
Candies (M&Ms):	NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS

4. Should there be changes to the sweets? (circle your answer) YES / NO

5. Which if any of the following changes would you like to see?

(tick all you agree with)

BUTTERSCOTCH IN ONE MENU	[]
SOFT LOLLIES IN ONE MENU eg. JUBES	[]
LIFE SAVERS IN ONE MENU	[]
DARK CHOCOLATE	[]
INCLUDE DRIED FRUIT	[]
VARIETY OF CHEWING GUM	[]
OTHER: (please describe)	

MAIN MEALS

6. The following series of questions asks you to give your opinion of the taste of each freeze dried meal by placing a circle around the appropriate word (s). There is also a heading "Problems" for any comments such as "Too Salty", "Too much meat", "Meat pieces break up too easily", "Not enough vegetables", "Too bland", "Insufficient quantity", or "Meat tough".

LAMB CURRY AND RICE

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

BEEF AND BEANS

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

SPAGHETTI AND MEAT SAUCE

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

BEEF AND ONIONS

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

BEEF AND NOODLES

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

ROAST PORK AND GRAVY

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

TUNA AND RICE

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

VEAL ITALIENNE

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

CHICKEN TETRAZZINI

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

BEEF STEAK FINGERS

Taste: VERY GOOD GOOD FAIR POOR VERY POOR

Problems: _____

7. What changes, if any, would you like to see to the freeze dried meals?

(tick all that apply)

- ONE SPICY MEAL []
 ONE SWEET AND SOUR MEAL []
 ANOTHER FISH MEAL []
 ANOTHER CHICKEN MEAL []
 INCLUDE A COLD / DOESN'T REQUIRE HEAT MEAL []
 NO CHANGES []
 OTHER (please describe): []

8. How did you prepare the majority of your freeze dried meals?

- DIDN'T, ATE IT DRY & COLD []
 ADDED WATER & ATE COLD []
 ADDED WATER TO MEAL THEN HEATED []
 HEATED WATER AND THEN ADDED MEAL []
 OTHER (please describe) []

9. Indicate your opinion of the Hexamine Stove for use in the field:

Speed of heating:	SLOW	FAIR	FAST
Ease of use:	HARD	REASONABLE	EASY
Overall acceptability:	UNACCEPTABLE	NEUTRAL	ACCEPTABLE
Amount of use:	ALWAYS	SOMETIMES	NEVER

10. Which of these were problems while using freeze dried meals: (tick all that apply)

OPENING THE POUCH	<input type="checkbox"/>
POUCH SPLITS TOO EASILY	<input type="checkbox"/>
ADDING WATER TO THE BAG	<input type="checkbox"/>
POUCH TOO AWKWARD TO HANDLE	<input type="checkbox"/>
POUCH TOO HOT TO HANDLE	<input type="checkbox"/>
MEAL DOESN'T HEAT WELL	<input type="checkbox"/>
FIELD DUTIES DO NOT ALLOW ENOUGH TIME TO HEAT	<input type="checkbox"/>
OTHER PROBLEMS	<input type="checkbox"/>

11. When you ate the freeze dried meals, did you usually: (tick all that apply)

RELAX AND ENJOY YOUR MEAL	<input type="checkbox"/>
WORK	<input type="checkbox"/>
MOVE WHILST EATING	<input type="checkbox"/>
HAVE TO EAT IT QUICKLY	<input type="checkbox"/>
OTHER	<input type="checkbox"/>

12. Estimate the length of time, in days, usually spent on PR1M

LEAST TIME	<input type="checkbox"/>	days
USUAL RANGE	<input type="checkbox"/>	to <input type="checkbox"/> days
MOST TIME	<input type="checkbox"/>	days
OTHER (eg. this is first time) _____		

13. Estimate the TOTAL days each year you usually spend of the PR1M ("dehyd pack").

0 - 10 DAYS / YEAR	<input type="checkbox"/>
10 - 20 DAYS / YEAR	<input type="checkbox"/>
20 - 40 DAYS / YEAR	<input type="checkbox"/>
40 - 60 DAYS / YEAR	<input type="checkbox"/>
OVER 60 DAYS / YEAR	<input type="checkbox"/>

14. In general how easy is it to obtain water? HARD FAIR EASY

15. Where did you obtain water? (tick all that apply)

STREAM / RIVER (Flowing)	<input type="checkbox"/>
LAKE / POND (Still)	<input type="checkbox"/>
ARMY SUPPLIED WATER (Jerricans etc.)	<input type="checkbox"/>
OTHER (please describe) _____	<input type="checkbox"/>

BEVERAGES

16. Give your opinion of the TASTE of the drinks below by circling the appropriate descriptive words:

TEA:	GOOD	FAIR	POOR	DIDN'T DRINK
COFFEE:	GOOD	FAIR	POOR	DIDN'T DRINK
CHOC. DRINK:	GOOD	FAIR	POOR	DIDN'T DRINK
BEVERAGE POWDERS:	GOOD	FAIR	POOR	DIDN'T DRINK

Problems: _____

17. Which if any of the following changes to the drinks would you like to see?

(tick all appropriate boxes)

MORE COFFEE / LESS TEA	[]
MORE TEA / LESS COFFEE	[]
MORE CHOCOLATE DRINK	[]
MORE COLD DRINKS	[]
MORE VARIETY	[]
INCLUDE SOUP	[]
IMPROVED FRUIT DRINK	[]
OTHER (please describe)	[]

18. What is your opinion of the condensed milk? (circle your answer)

SUITABLE FOR PR1M:	YES	NO
AMOUNT:	ENOUGH	NOT ENOUGH

If "NOT SUITABLE", what is a suitable replacement?

CONDIMENTS

19. Show your opinion of the quantity of sugar and salt provided. (circle your answer)

Salt:	TOO MUCH	ENOUGH	NOT ENOUGH
Sugar:	TOO MUCH	ENOUGH	NOT ENOUGH
Pepper:	TOO MUCH	ENOUGH	NOT ENOUGH

20. Should other flavouring be added to the packs, eg. curry powder, chilli, garlic, tomato paste or sauce? YES / NO

If "YES", which flavourings would you like to see?

NON-FOOD ITEMS

21. Was the box of matches satisfactory? (circle your answer) YES / NO

If not, how could it be improved?

22. Was there sufficient toilet paper? (circle your answer) YES / NO

23. Was the toilet paper satisfactory? (circle your answer) YES / NO

If "NO", how could it be improved?

GENERAL QUESTIONS

24. Did you discard any items from the Patrol Ration One Man (PR1M)? YES / NO

If "YES", indicate which items you discarded and why.

Item: _____ Reason: _____

Item: _____ Reason: _____

Item: _____ Reason: _____

Item: _____ Reason: _____

Item: _____ Reason: _____

Item: _____ Reason: _____

25. Did you exchange any PR1M items with other soldiers? YES / NO

If "YES", indicate which items you exchanged

Item: _____ Exchanged for : _____

Item: _____ Exchanged for : _____

Item: _____ Exchanged for : _____

Item: _____ Exchanged for : _____

26. What extra foods (not in the Patrol Ration One Man) did you take?

27. How would you describe the quantity of food as a whole? (circle your answer)
ENOUGH / NOT ENOUGH

28. If new items were to be added to the ration what foods would you prefer?

29. If items were to be deleted, which would you delete?

30. Was the packaging suitable? (circle your answer) YES / NO

If "NO" how could it be improved?

31. Were the instructions clear and informative? YES / NO

If "NO" which aspects were not satisfactory? (please describe)

32. Indicate the suitability of the weight and size of the PR1M

Weight:	GOOD	FAIR	TOO HEAVY
Size:	GOOD	FAIR	TOO BULKY

33. Are there situations the PR1M would not be suitable for Patrol Activities? YES/NO

If "YES" please describe

34. Would a very light weight ration, that did not provide as much food (eg. cold drinks and brew gear, plus 3 food bars) be suitable to your use? YES / NO

How often would it be suitable?

NEVER	[]
RARELY	[]
SOMETIMES	[]
USUALLY	[]
ALWAYS	[]

35. List any further suggestions you have for improving the Patrol Ration One Man.

36. How would you expect to like / dislike each of the following items, if they were part of the PR1M? (tick which applies)

	LIKE VERY MUCH	LIKE	NEUTRAL	DISLIKE	DISLIKE VERY MUCH
PIZZA	[]	[]	[]	[]	[]
MEAT/CHEESE POCKETS	[]	[]	[]	[]	[]
SALAMI MEAT STICKS	[]	[]	[]	[]	[]
MIXED NUTS	[]	[]	[]	[]	[]
CHEESEFILLED CRACKERS	[]	[]	[]	[]	[]
PRETZELS / CORNCHIPS	[]	[]	[]	[]	[]
FRUIT BARS	[]	[]	[]	[]	[]
BUTTER CAKE	[]	[]	[]	[]	[]

Appendix B: Questionnaire results for both study groups

NOTE: As a result of rounding, percentages do not always add to 100%.

Q1-Indicate your opinion of taste for the following items

Item	Group	Percentage of responses				
		Very good	Good	Fair	Poor	Very Poor
Biscuits, Sweet	3RAR	33.3	41.0	20.5	5.1	0.0
	SASR	22.1	57.0	18.6	2.3	0.0
	Weighted average	25.6	52.0	19.2	3.2	0.0
Biscuits, Survival	3RAR	5.1	23.1	41.0	20.5	10.3
	SASR	9.3	23.3	34.9	19.8	12.8
	Weighted average	8.0	23.2	36.8	20.0	12.0
Rice, Freeze Dried	3RAR	2.6	35.9	25.6	28.2	7.7
	SASR	2.3	23.0	32.2	26.4	16.1
	Weighted average	2.4	27.0	30.2	27.0	13.5
Potato and Onion Powder	3RAR	7.7	15.4	20.5	28.2	28.2
	SASR	3.4	17.2	31.0	26.4	21.8
	Weighted average	4.8	16.7	27.8	27.0	23.8
Beef or Chicken Noodles	3RAR	7.7	69.2	15.4	2.6	5.1
	SASR	17.2	47.1	20.7	10.3	4.6
	Weighted average	14.3	54.0	19.0	7.9	4.8
Muesli Bars	3RAR	28.2	38.5	15.4	10.3	7.7
	SASR	27.6	46.0	17.2	8.0	1.1
	Weighted average	27.8	43.7	16.7	8.7	3.2

Indicate your opinion on quantity for the following items

Item	Group	Percentage of responses		
		Too much	Enough	Not enough
Biscuits, Sweet	3RAR	0.0	64.9	35.1
	SASR	2.4	89.4	8.2
	Weighted average	1.6	82.0	16.4
Biscuits, Survival	3RAR	13.5	78.4	8.1
	SASR	14.1	76.5	9.4
	Weighted average	13.9	77.0	9.0
Rice, Freeze Dried	3RAR	10.8	83.8	5.4
	SASR	23.8	67.9	8.3
	Weighted average	19.8	72.7	7.4

Item	Group	Percentage of responses		
		Too much	Enough	Not enough
Potato and Onion Powder	3RAR	33.3	55.6	11.1
	SASR	32.1	65.5	2.4
	Weighted average	32.5	62.5	5.0
Beef or Chicken Noodles	3RAR	5.4	75.7	18.9
	SASR	7.1	82.4	10.6
	Weighted average	6.6	80.3	13.1
Muesli Bars	3RAR	2.7	67.6	29.7
	SASR	3.6	76.2	20.2
	Weighted average	3.3	73.6	23.1

Q2-Which if any of the changes to the biscuits and cereals would you like to see?

Suggested change	Percentage who agree with change		
	3RAR	SASR	Weighted average
Include Raisin Luncheon Biscuits	38.5	49.4	46.0
Make Use of Savoury Biscuits	74.4	59.8	64.3
Use of Whole Grain Rice	25.6	21.8	23.0
Delete Noodles	15.4	20.7	19.0
Delete Rice	28.2	37.9	34.9
Delete Potato / Onion Powder	56.4	51.7	53.2
Greater Variety	74.4	41.4	51.6

Q3-Show how often you ate the following items in the field:

Frequency of Eating	Group	Percentage of responses				
		Never	Rarely	Sometimes	Often	Always
Chocolate	3RAR	5.1	2.6	10.3	28.2	53.8
	SASR	3.4	10.3	18.4	23.0	44.8
	Weighted average	4.0	7.9	15.9	24.6	47.6
Chewing gum	3RAR	12.8	17.9	10.3	15.4	43.6
	SASR	17.4	18.6	25.6	15.1	23.3
	Weighted average	16.0	18.4	20.8	15.2	29.6
Candies (M&Ms)	3RAR	5.1	5.1	12.8	15.4	61.5
	SASR	4.7	8.2	21.2	20.0	45.9
	Weighted average	4.8	7.3	18.5	18.5	50.8

Q4-Should there be changes to the sweets?

Group	Percentage of responses		
	Yes	No	No response
3RAR	59.0	25.6	15.4
SASR	58.6	29.9	11.5
Weighted average	58.7	28.6	12.7

Q5-Which changes would you like to see?

Suggested change	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
Butterscotch in one Menu	76.9	40.2	51.6
Soft Lollies in one Menu eg Jubes	82.1	58.6	65.9
Life Savers in one Menu	48.7	37.9	41.3
Dark Chocolate	48.7	37.9	41.3
Include Dried Fruit	66.7	81.6	77.0
Variety of Chewing Gum	52.6	35.6	40.5

Q6-Indicate your opinion of taste for the following items

Item	Group	Percentage of responses				
		Very good	Good	Fair	Poor	Very poor
Lamb Curry and Rice	3RAR	26.3	39.5	34.2	0.0	0.0
	SASR	10.6	48.2	27.1	11.8	2.4
	Weighted average	15.4	45.5	29.3	8.1	1.6
Beef and Beans	3RAR	35.1	48.6	10.8	5.4	0.0
	SASR	10.8	47.0	31.3	9.6	1.2
	Weighted average	18.3	47.5	25.0	8.3	0.8
Spaghetti and Meat Sauce	3RAR	38.5	46.2	12.8	2.6	0.0
	SASR	35.7	46.4	17.9	0.0	0.0
	Weighted average	36.6	46.3	16.3	0.8	0.0
Beef and Onions	3RAR	25.6	48.7	17.9	7.7	0.0
	SASR	10.7	44.0	34.5	7.1	3.6
	Weighted average	15.4	45.5	29.3	7.3	2.4
Beef and Noodles	3RAR	34.2	44.7	21.1	0.0	0.0
	SASR	13.4	50.0	29.3	4.9	2.4
	Weighted average	20.0	48.3	26.7	3.3	1.7
Roast Pork and Gravy	3RAR	43.2	40.5	10.8	5.4	0.0
	SASR	25.9	44.7	15.3	10.6	3.5
	Weighted average	31.1	43.4	13.9	9.0	2.5
Tuna and Rice	3RAR	16.2	27.0	45.9	8.1	2.7
	SASR	9.5	31.0	32.1	15.5	11.9
	Weighted average	11.6	29.8	36.4	13.2	9.1
Veal Italienne	3RAR	51.3	33.3	15.4	0.0	0.0
	SASR	29.3	50.0	13.4	4.9	2.4
	Weighted average	36.4	44.6	14.0	3.3	1.7
Chicken Tetrizzini	3RAR	51.3	38.5	5.1	5.1	0.0
	SASR	60.7	25.0	11.9	2.4	0.0
	Weighted average	57.7	29.3	9.8	3.3	0.0
Beef Steak Fingers	3RAR	46.2	38.5	12.8	2.6	0.0
	SASR	14.6	47.6	26.8	7.3	3.7
	Weighted average	24.8	44.6	22.3	5.8	2.5

Q7-What changes, if any, would you like to see to the freeze dried meals?

Suggested change	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
One Spicy Meal	56.4	44.8	48.4
One Sweet and Sour Meal	38.5	21.8	27.0
Another Fish Meal	12.8	5.7	7.9
Another Chicken Meal	56.4	55.2	55.6
Include a Cold/Doesn't Require Heat Meal	66.7	70.1	69.0
No Changes	5.1	5.7	5.6

Q8-How did you prepare the majority of your freeze dried meals?

Preparation	Percentage of respondents		
	3RAR	SASR	Weighted average
Didn't, ate it dry and cold	0.0	1.7	1.1
Added water & ate it cold	0.0	10.2	7.7
Added water to meal then heated	6.7	6.8	6.6
Heated water and then added meal	93.3	81.4	84.6

Q9-Indicate your opinion on the hexamine stove for use in the field:

Criteria	Response	Percentage of respondents		
		3RAR	SASR	Weighted average
Speed of heating	Slow	23.7	11.9	15.6
	Fair	65.8	70.2	68.9
	Fast	10.5	17.9	15.6
Ease of use	Hard	2.6	2.4	2.5
	Reasonable	50.0	48.8	49.2
	Easy	47.4	48.8	48.3
Overall acceptability	Unacceptable	15.8	11.0	12.5
	Neutral	50.0	36.6	40.8
	Acceptable	34.2	52.4	46.7
Amount of use	Always	44.7	45.1	45.0
	Sometimes	39.5	52.4	48.3
	Never	15.8	2.4	6.7

Q10-Which, if any, were problems when using freeze dried meals?

Problem	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
Opening the Pouch	25.6	25.3	25.4
Pouch splits too easily	5.1	12.6	10.3
Adding water to the bag	5.1	10.3	8.7
Pouch too awkward to handle	5.1	13.8	11.1
Pouch too hot to handle	15.4	16.1	15.9
Meal doesn't heat well	5.1	2.3	3.2
Field duties do not allow enough time to heat	53.8	26.4	34.9

Q11-When you ate the freeze dried meals, did you usually:

Comment	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
Relax and enjoy your meal	48.7	27.6	34.1
Work	38.5	31.0	33.3
Move whilst eating	23.1	5.7	11.1
Have to eat it quickly	82.1	78.2	79.4

Q12&13-Estimate the total days per year you usually spend on the PR1M:

Range	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
0 - 10 Days / Year	58.8	11.3	33.0
10 - 20 Days / Year	8.8	18.8	14.3
20 - 40 Days / Year	8.8	33.8	23.8
40 - 60 Days / Year	11.8	17.5	14.3
Over 60 Days / Year	11.8	18.8	15.1

Q14-In general how easy is it to obtain water?

Response	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
Hard	5.3	33.3	24.4
Fair	60.5	55.6	57.1
Easy	34.2	11.1	18.5

Q15-Where did you obtain water?

Place	Percentage of respondents who obtained water		
	3RAR	SASR	Weighted average
Stream / River (Flowing)	21.1	72.4	56.3
Lake / Pond (Still)	2.6	44.3	31.7
Army Supplied Water (Jerricans etc)	100.0	87.4	90.5

Q16-Give your opinion on the taste of the following drinks:

Drink	Group	Percentage of responses			
		Good	Fair	Poor	Didn't drink
Tea	3RAR	33.3	23.1	0.0	43.6
	SASR	39.3	34.5	3.6	22.6
	Weighted average	37.4	30.9	2.4	29.3
Coffee	3RAR	46.1	30.8	7.7	15.4
	SASR	35.7	32.1	11.9	20.2
	Weighted average	39.0	31.7	10.6	18.7
Chocolate Drink	3RAR	71.8	23.1	2.6	2.6
	SASR	32.1	42.9	7.1	17.9
	Weighted average	44.7	36.6	5.7	13.0
Beverage Powders	3RAR	35.9	41.0	15.4	7.7
	SASR	28.6	45.2	19.0	7.1
	Weighted average	30.9	43.9	17.9	7.3

Q17-Which, if any, of the following changes to the drinks would you like to see?

Suggested change	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
More Coffee / Less Tea	51.3	28.7	35.7
More Tea / Less Coffee	5.1	4.6	4.8
More Chocolate Drink	66.7	27.6	39.7
More Cold Drinks	38.5	26.4	30.2
More Variety	38.5	23.0	27.8
Include Soup	48.7	49.4	49.2
Improved Fruit Drink	66.7	63.2	64.3

Q18-What is your opinion of the condensed milk?

Criteria	Response	Percentage of respondents		
		3RAR	SASR	Weighted average
Suitable for PR1M	Yes	97.4	95.2	95.9
	No	2.6	4.8	4.1
Sufficient amount	Yes	32.4	81.8	65.8
	No	47.6	18.2	34.2

Q19-Show your opinion of the quantity of condiments provided:

Condiment	Group	Percentage of respondent who chose;		
		Too Much	Enough	Not Enough
Salt	3RAR	10.5	81.6	7.9
	SASR	17.6	82.4	0.0
	Weighted average	15.4	82.1	2.4

Condiment	Group	Percentage of respondent who chose;		
		Too Much	Enough	Not Enough
Sugar	3RAR	20.5	59.0	20.5
	SASR	50.6	45.9	3.5
	Weighted average	41.1	50.0	8.9
Pepper	3RAR	16.2	81.1	2.7
	SASR	17.6	76.5	5.9
	Weighted average	17.2	77.9	4.9

Q20-Should other flavourings be added to packs, eg. curry powder, chilli, garlic, tomato paste or sauce?

Group	Percentage of responses	
	Yes	No
3RAR	73.0	27.0
SASR	76.8	23.2
Weighted average	75.6	24.4

Q21-23 Adequacy of non-food items.

Question	Group	Percentage of responses	
		Yes	No
Was box of matches satisfactory?	3RAR	17.9	82.1
	SASR	29.8	70.2
	Weighted average	26.0	74.0
Was there sufficient toilet paper?	3RAR	79.5	20.5
	SASR	84.7	15.3
	Weighted average	83.1	16.9
Was the toilet paper satisfactory?	3RAR	94.7	5.3
	SASR	83.3	16.7
	Weighted average	86.9	13.1

Q24-25 Did you discard or exchange any items from the PR1M?

Action	Group	Percentage of responses	
		Yes	No
Discard	3RAR	48.5	51.5
	SASR	77.8	22.2
	Weighted average	67.7	32.3
Exchange	3RAR	24.2	75.8
	SASR	41.7	58.3
	Weighted average	36.2	63.8

Q27-How would you describe the quantity of food as a whole?

Group	Percentage of responses		
	Too Much	Enough	Not Enough
3RAR	0.0	48.6	51.4
SASR	1.2	81.7	17.1
Weighted average	0.8	71.4	27.7

Q30-31 General questions

Question	Group	Percentage of responses	
		Yes	No
Was the packing suitable?	3RAR	94.7	5.3
	SASR	58.5	41.5
	Weighted average	70.0	30.0
Were instructions clear and informative?	3RAR	100.0	0.0
	SASR	96.3	3.8
	Weighted average	97.5	2.5

Q32-Indicate the suitability of the weight and size of the PR1M

	Group	Percentage of respondents who chose response		
		Good	Fair	Too heavy
Weight	3RAR	45.9	48.6	5.4
	SASR	35.8	54.3	9.9
	Weighted average	39.0	52.5	8.5
		Good	Fair	Too bulky
Size	3RAR	20.6	52.9	26.5
	SASR	28.4	47.8	23.9
	Weighted average	25.7	49.5	24.8

Q33-Are there situations where PR1M would not be suitable for Patrol Activities

Group	Percentage of responses	
	Yes	No
3RAR	37.1	62.9
SASR	54.1	45.9
Weighted average	48.6	51.4

Q34-Would a very light weight ration be suitable to your use?

Group	Percentage of responses	
	Yes	No
3RAR	57.9	42.1
SASR	79.3	20.7
Weighted average	72.5	27.5

How often would it be suitable?

Frequency	Percentage of respondents who agree		
	3RAR	SASR	Weighted average
Never	0.0	0.0	0.0
Rarely	13.6	6.2	8.0
Sometimes	77.3	60.0	64.4
Usually	4.5	24.6	19.5
Always	4.5	9.2	8.0

Q36-How would you expect to like/dislike each of the following items, if they were part of the PR1M?

Item	Group	Percentage of respondents who chose response				
		Like very much	Like	Neutral	Dislike	Dislike very much
Pizza	3RAR	51.4	27.0	13.5	2.7	5.4
	SASR	25.3	25.3	31.6	15.2	2.5
	Weighted average	33.6	25.9	25.9	11.2	3.4
Meat/cheese pockets	3RAR	63.2	31.6	5.3	0.0	0.0
	SASR	29.5	46.2	16.7	6.4	1.3
	Weighted average	40.5	41.4	12.9	4.3	0.9
Salami meat sticks	3RAR	81.6	15.8	2.6	0.0	0.0
	SASR	44.4	35.8	16.0	3.7	0.0
	Weighted average	56.3	29.4	11.8	2.5	0.0
Mixed nuts	3RAR	68.4	13.2	15.8	2.6	0.0
	SASR	59.8	30.5	9.8	0.0	0.0
	Weighted average	62.5	25.0	11.7	0.8	0.0
Cheese filled crackers	3RAR	60.5	28.9	7.9	2.6	0.0
	SASR	35.4	38.0	17.7	8.9	0.0
	Weighted average	43.6	35.0	14.5	6.8	0.0
Pretzels/cornchips	3RAR	37.1	31.4	28.6	0.0	2.9
	SASR	23.0	27.0	24.3	20.3	5.4
	Weighted average	27.3	29.1	25.5	13.6	4.5
Fruit bars	3RAR	55.3	28.9	15.8	0.0	0.0
	SASR	52.4	35.4	8.5	3.7	0.0
	Weighted average	53.3	33.3	10.8	2.5	0.0
Butter cake	3RAR	42.1	21.1	21.1	2.6	13.2
	SASR	15.8	19.7	42.1	18.4	3.9
	Weighted average	24.6	20.2	35.1	13.2	7.0

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19. ABSTRACT This report illustrates the current level of user acceptability and service suitability of the PR1M, and each of its components, currently in service in the ADF. Items which have diminished in their acceptability have been identified and recommendations for appropriate alterations have been made.					